

**elcometer® NDT**



# Flaw Detectors

# FD700+ & FD700DL+, FD800DL & FD800DL+

These powerful bench top & hand-held flaw detectors combine state-of-the-art flaw detection with advanced material thickness capabilities.

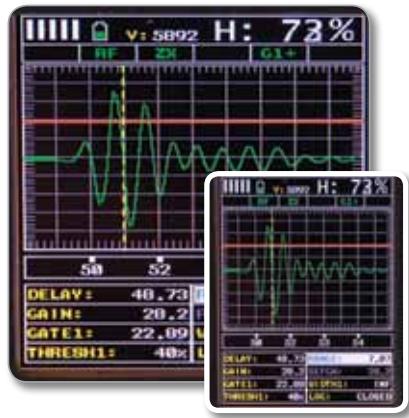
With all the functionality of the top of the range material thickness gauge, the FD700 and FD800 series, when in flaw detection mode offers a variety of tool kits which enable fast and accurate flaw detection, ideal for weld inspection, forgings or composite material testing.

Tool kits include:

- TRIG enabling location of flaws in both surface distance and depth from the transducer.
- TCG (time corrected gain) increases gain as time increases, in order to achieve an overall level of sensitivity for the same flaw/reflector at different distances.
- DAC for the creation of DAC curves which are used to inform the operator of the size of any given flaw at any depth.
- AWS function provides automatic defect sizing in accordance with AWS D1.1 structural welding code.
- DGS/AVG allows automatic defect sizing from a single reference defect.

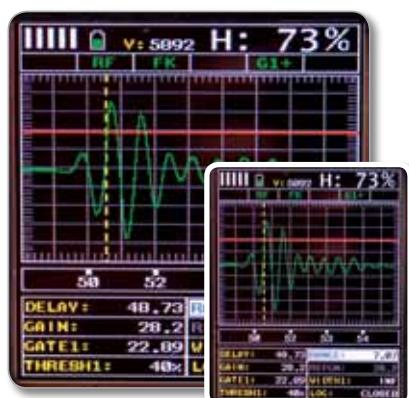
## Zero Crossing

The gate detects the flank of the pulse, but the measurement is taken at the next crossing of the x axis. This is the most common type of detect in ultrasonic measurement.



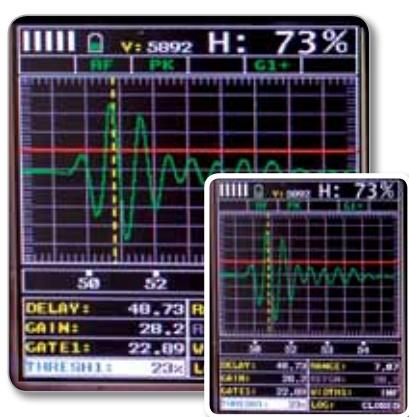
## Flank

The gate is triggered by the flank (or side) of the pulse on the graph and the measurement taken at this exact point.



## Peak

The gate is triggered by the intersection with the A-scan pulse and the detection is taken from the next peak in the signal (when it stops rising and starts falling).



## TRIG

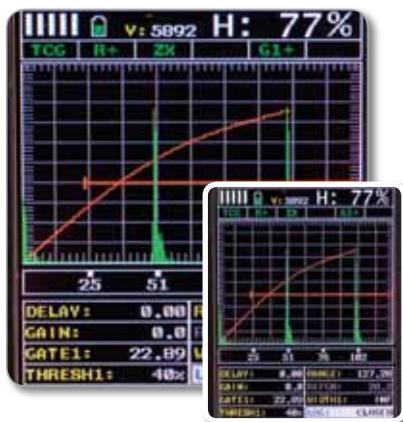
TRIG enabling location of flaws in both surface distance and depth. Trigonometric display of beam path, depth, surface distance, and curved surface correction. Used with angle beam transducers.



For the full range of transducers visit [elcometerNDT.com](http://elcometerNDT.com)

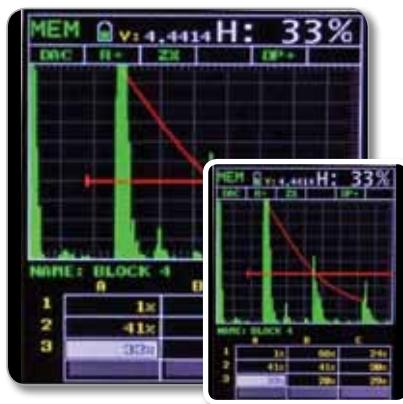


# Flaw Detection Gauges



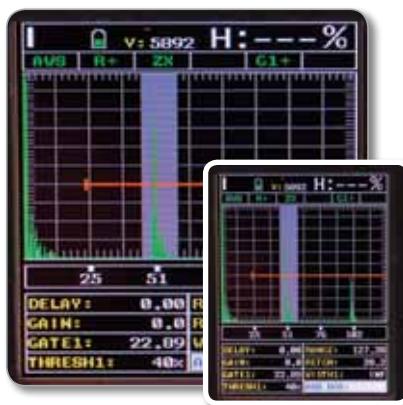
## TCG

Time corrected gain increases gain as distance increases, in order to achieve an overall level of sensitivity for the same flaw/reflector at different distances.



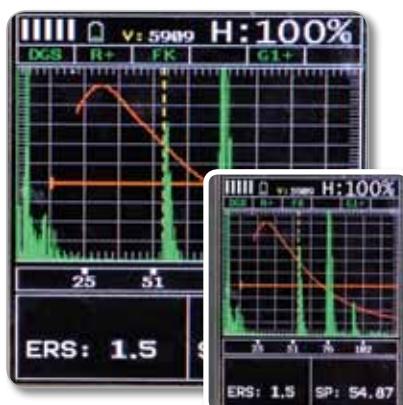
## DAC

Distance amplitude correction for the creation of DAC curves which allow the operator to compare flaws of the same size at different depths.



## AWS

The American Weld Standard function provides automatic defect sizing in accordance with AWS D1.1 structural welding code.



## DGS/AVG

Allows automatic defect sizing from a single reference defect.



compatible with  
**ElcoMaster™**

The hand-held FD700 flaw detector series combines state-of-the-art flaw detection with advanced material thickness capabilities.



## Features

- Exceptional visibility in sunlight (AMOLED) colour VGA display (320x240 pixels)
- Sizing Toolkits: DAC, AWS, TCG, DGS
- Pulse Repetition Frequency: 8 to 333 Hz, adjustable
- Screen Refresh Rate: Adjustable 60 & 120 Hz
- Detection: Z-Cross, Flank & Peak
- Automatic: probe zero, probe recognition, and temperature compensation
- Measurement: Variety of modes to address a number of applications
- Large data storage with multiple formats: Alpha numeric grid and sequential with auto identifier
- Download to ElcoMaster™ data management software

Whether you are on-site or in the laboratory these gauges are the tool you need for all your flaw detecting needs.

The time corrected gain (TCG) feature automatically compensates for sound attenuation through a material, further increasing the performance of the gauge.

The FD700DL+ stores up to 8,000 readings with A/B-scan images in alpha numeric batches with full data logging via RS232 data output to ElcoMaster™ data management software.

For the full range  
of transducers visit  
[elcometerNDT.com](http://elcometerNDT.com)



The bench-top FD800 flaw detector series combines state-of-the-art flaw detection with advanced material thickness capabilities.

## Features

- Blanview sunlight readable QVGA TFT colour display
- Sizing Toolkits: DAC, AWS, TCG, DGS
- Pulse Repetition Frequency: 8 to 333 Hz, adjustable
- Screen Refresh Rate: 60Hz
- Detection: Z-Cross, Flank & Peak
- Automatic: probe zero, probe recognition, and temperature compensation
- Measurement: Variety of modes to address a number of applications
- Large data storage: 6Gb internal & up to 64Gb external SD slot
- Multiple formats: Alpha numeric grid and sequential with auto identifier
- Up to 12 hours of battery life
- Download to ElcoMaster™ data management software

Designed for use in the laboratory these gauges are the tool you need for all your flaw detecting needs.

The time corrected gain (TCG) feature automatically compensates for sound attenuation through a material, further increasing the performance of the gauge.

Within the grid batching of the FD800DL+ the user has the capability to enter 'OBSTRUCT' on to the grid for easy identification of inaccessible locations to measure.

The FD800DL+ has a 6Gb internal memory and an external SD slot which allows up to 64Gb with full data logging via RS232 data output to ElcoMaster™ data management software.



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# FD700+ & FD700DL+, FD800DL & FD800DL+

## Material Thickness Features

Model & Part Number	FD700+ & FD700DL+	FD800DL & FD800DL+
<b>Display Mode:</b> Material thickness digits display B-Scan cross sectional display B-Scan with digits display Scan bar display Coating thickness display A-Scan display Flaw detection modes		<ul style="list-style-type: none"> <li>●</li> <li>●</li> <li>●</li> <li>●</li> <li>●</li> <li>+ Rectified, - Rectified, Full Waveform (RF) TRIG, DAC, AWS, TCG, Zero Crossing, Flank, Peak</li> </ul>
<b>Measurement Mode<sup>1</sup></b>	PE, PETP (Temp Compensation), EE (ThruPaint™), EEV, CT (Coating) & PECT	
<b>Measurement Rate (Thickness Mode)</b> <b>Manual:</b> Scan mode Scan bar display		<p>4 readings per second 32 readings per second 6 readings per second</p>
<b>Measuring Range<sup>2</sup></b>		<p>PE: 0.63 - 30480mm (0.025 - 1,200 inches) PETP: 0.63 - 30480mm (0.025 - 1,200 inches) EE: 1.27 - 102mm (0.050 - 4.000 inches) EEV: 1.27 - 25.4mm (0.050 - 1.000 inches) CT: 0.01 - 2.54mm (0.0005 - 0.100 inches) PECT: 0.63 - 30480mm (0.025 - 1,200 inches) PECT: 0.01 - 2.54mm (0.0005 - 0.100 inches)</p>
<b>Measurement Accuracy<sup>2</sup></b>		± 1% or ±0.1mm whichever is the greater
<b>Measurement Resolution</b>		0.01mm (0.001 inches)
<b>Velocity Calibration Range</b>		256 - 16,000m/s (0.0100 - 0.6300in/ms)
<b>Additional Features:</b> High speed scan mode Differential mode Limit alarm mode		<ul style="list-style-type: none"> <li>●</li> <li>●</li> <li>●</li> </ul>
<b>B-Scan display speed</b>		adjustable display speed
<b>Calibration Setups</b>		6 factory & 64 user-definable setups transferrable to and from a PC archive
<b>Gates</b>		3 fully adjustable gates: start, stop, width & threshold
<b>Damping</b>		adjustable; impedance matching for optimising transducer performance
<b>Pulser Type</b>	dual 200 volt square wave pulsers with adjustable pulse width (spike, thin, wide) and 50 volt cut/boost for greater penetration	FD800DL: two adjustable square wave pulsers. FD800DL+: two tone burst pulsers
<b>Gain</b>		manual, automatic gain control (AGC) with 110dB range with 0.2dB resolution
<b>Timing</b>	precision 25MHz TCXO with single shot 100MHz 8bit ultra low power 8 bit digitizer	precision TCXO timing with single shot 100MHz 8bit ultra low power digitizer
<b>Data Logging</b>	<ul style="list-style-type: none"> <li>• 8,000 with A/B-scan image &amp; gauge settings</li> <li>• 210,000 - coating, material, min, max thickness</li> <li>• sequential and grid logging</li> <li>• Alpha numeric batch identification</li> <li>• OBSTRUCT indicates inaccessible locations</li> </ul>	<ul style="list-style-type: none"> <li>• 6Gb internal &amp; up to 64Gb external SD slot</li> <li>• Bitmap graphic capture</li> <li>• sequential and grid logging</li> <li>• Alpha numeric batch identification</li> <li>• OBSTRUCT indicates inaccessible locations</li> </ul>
<b>Calibration Options</b>		single, two point, velocity & material type
<b>Transducer Recognition</b>		automatic
<b>V-path / dual path error correction</b>		automatic
<b>Probe Zero</b>		automatic

<sup>1</sup> PE: Pulse-Echo Mode, EE: Echo-Echo (ThruPaint™) Mode.

<sup>2</sup> Measuring range & accuracy depends on material, surface conditions and the transducer selected.

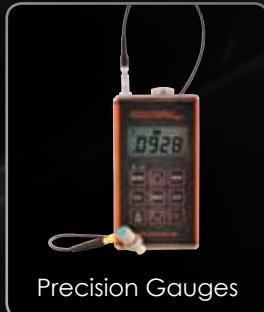
# Specifications

## Flaw Detection Features

Flaw Detection Mode Features	FD700+ & FD700DL+	FD800DL & FD800DL+
<b>Automatic Calibration:</b>	Longitudinal (straight), or Shear (angle)	
<b>Probe Types:</b>	Single Contact, Dual, Delay & Angle	
<b>Material Velocity Table:</b>	Contains longitudinal and shear velocities for a variety of material types	
<b>TRIG</b>	Trigonometric display of beam path, depth, surface distance, and curved surface correction. Used with angle beam transducers	
<b>DAC</b>	Up to 8 points may be entered and used to digitally draw a DAC curve. Reference -2, -6, -10, (-6/-12), (-6/-14), (-2/-6/-10) dB. Amplitude displayed in %DAC, dB, or %FSH	
<b>AWS</b>	Automatic defect sizing in accordance with AWS D1.1 structural welding code.	
<b>AVG/DGS</b>	Automatic defect sizing using probe data. Stores up to 64 custom setups	
<b>TCG</b>	Time corrected gain. 50 dB dynamic range, 20 dB per microsecond, up to 8 points for curve definition	
<b>Detection Modes</b>	Zero Crossing, Flank and Peak	
<b>Display Freeze</b>	Hold current waveform on screen	
<b>Peak Memory</b>	Captures peak signal amplitude.	
<b>PRF</b>	8 to 2000Hz in selectable steps (8, 16, 32, 66, 125, 250, 333, 1000, 2000Hz)	
<b>Pulse Width</b>	40 to 400 ns. Selectable step options 40, 80 & 400 ns (labeled spike, thin & wide)	
<b>Frequency Bands</b>	FD700+ & FD700DL+: Broadband 1.8 - 19 MHz (-3dB). FD700DL+: Three narrow bands at 2MHz, 5MHz, 10MHz	FD800DL & FD800DL+: Broadband 1.8 - 19 MHz (-3dB). Four narrow bands at 1, 2, 5, 10MHz FD800DL+: Additional narrow bands at 0.5MHz, 15MHz
<b>Horizontal Linearity</b>	+/- 0.4% FSW	
<b>Vertical Linearity</b>	+/- 1% FSH	
<b>Amplifier Linearity</b>	+/- 1 dB	
<b>Amplitude Measurement</b>	0 to 100% FSH, with 1% resolution	
<b>Delay</b>	0 - 999in (25,375mm) at steel velocity	
<b>Display</b>	1/4 VGA AMOLED colour display 57.6 x 43.2mm (2.27 x 1.78inches) viewable area	Blanview sunlight readable QVGA TFT colour display. 115.2 x 86.4mm (4.54 x 3.40 inches) viewable screen
<b>Display Refresh Rate</b>	60 & 120Hz	60Hz
<b>Units (selectable)</b>	mm or inches	
<b>Backlight</b>	adjustable brightness	
<b>Repeatability / Stability Indicator</b>	●	
<b>Battery Type</b>	3 x AA alkaline	6 x AA alkaline
<b>Battery Life (approximate)</b>	12 hours	
<b>Low Battery Indicator</b>	●	
<b>Battery Save Mode</b>	auto	
<b>Operating Temperature</b>	-10 to 60°C (14 to 140°F)	
<b>Size (w x h x d)</b>	63.5 x 165.0 x 31.5mm (2.5 x 6.5 x 1.24 inches)	216.0 x 165.0 x 70.0mm (8.5 x 6.5 x 2.5 inches)
<b>Weight (including batteries)</b>	397g (14oz)	2.04kg (4.5lbs)
<b>Case Design</b>	Aluminium case design with gasket sealed end caps, waterproof membrane keypad	
<b>Transducer Connector Type</b>	LEMO	
<b>RS232 Interface</b>	Bi-directional	
<b>Packing List</b>	Elcometer NDT FD700+ or FD700DL+ gauge, couplant, carry case, user manual, test certificate, 3 x AA batteries, ElcoMaster™ software, transfer cable	Elcometer NDT FD800DL or FD800DL+ gauge, couplant, carry case, user manual, test certificate, 3 x AA batteries, ElcoMaster™ software, transfer cable



Corrosion Gauges



Precision Gauges



Velocity Gauges



Sonic Gauges



Flaw Detection



Bolt Gauges

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